

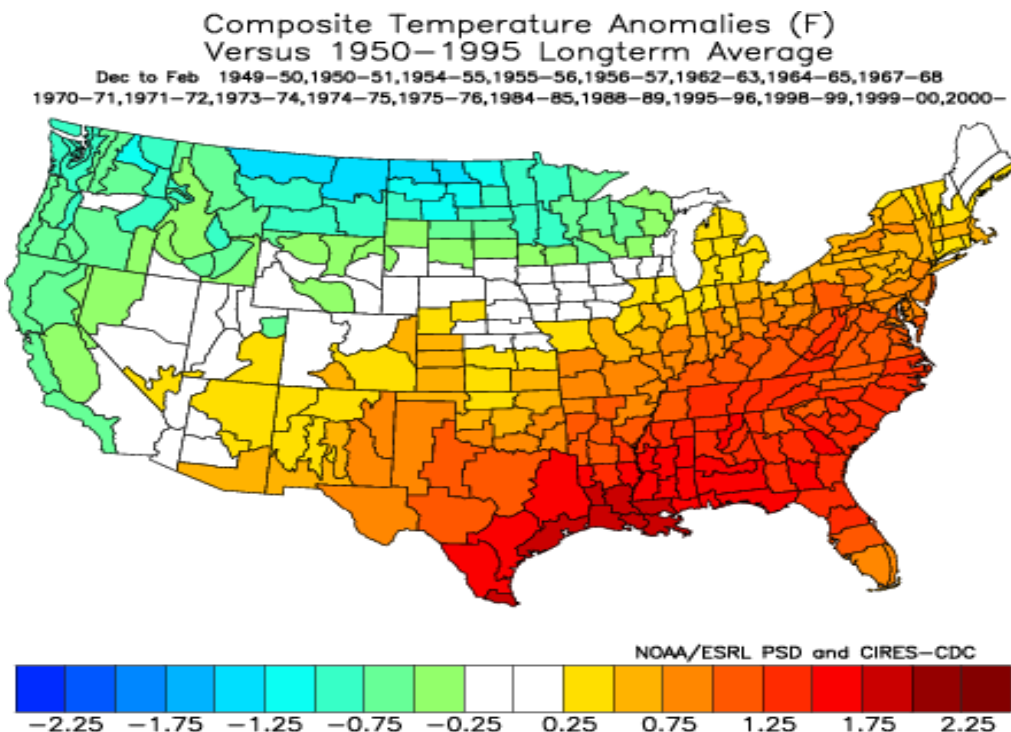
La Nina Impacts in Iowa

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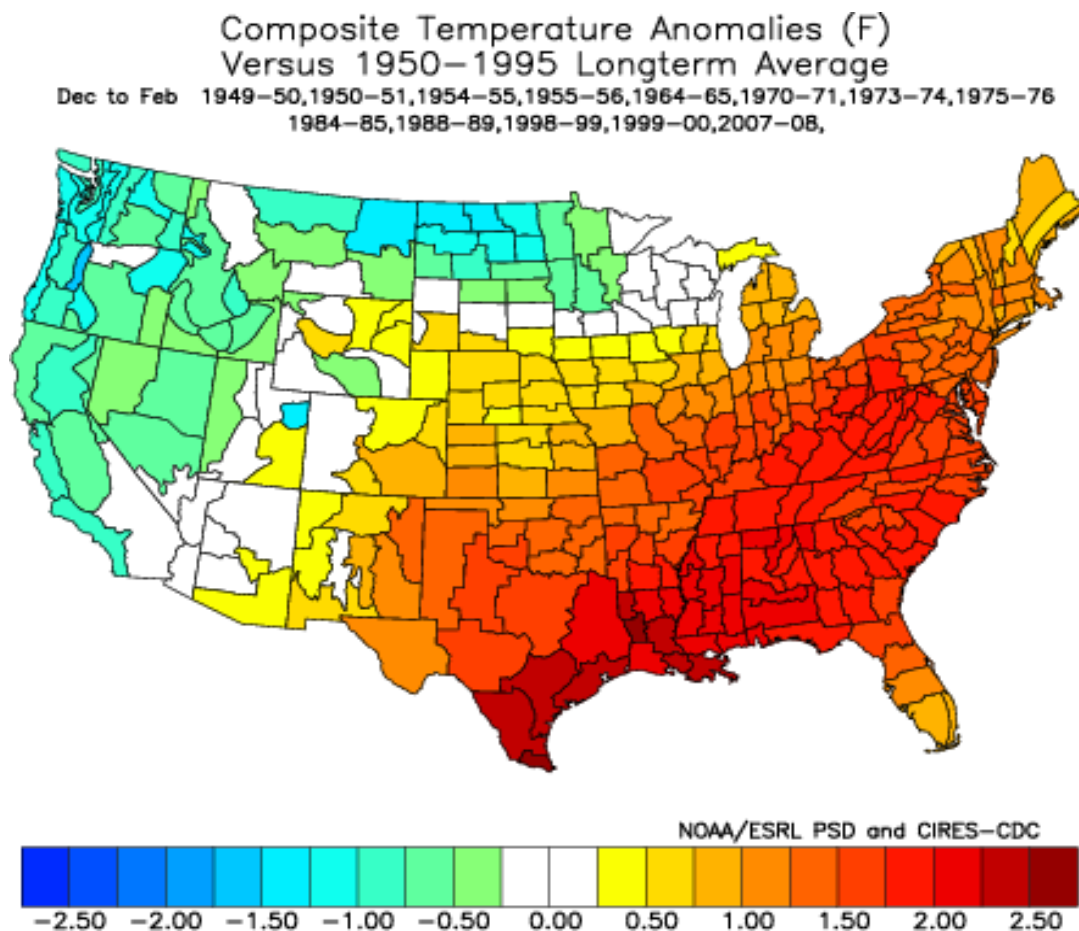
La Nina conditions currently exist across the equatorial Pacific Ocean, characterized by below normal sea surface temperatures near the equator in the eastern and central portions of the Pacific. While these conditions exist many thousands of miles away from Iowa, impacts from La Nina can be observed in Iowa and much of the United States. La Nina and El Nino conditions are determined by the Oceanic Nino Index (ONI). For more information on the ONI, please click [here](#). Meeting or exceeding an ONI index of -0.5°C for five consecutive overlapping seasons is considered a La Nina.

Impacts on both temperature and precipitation become apparent across the country, including Iowa, when La Nina years are compared to average conditions. In this report, we will look at the historical impacts in Iowa from late fall into early spring. This may give us some insight as to what could happen this upcoming winter.

In the first image below, we will look at temperature departures from average for all La Nina years from 1950-2009 where the ONI is -0.5°C or lower. Temperature anomalies across the state average near normal during the winter months. However, this does not mean that Iowa will see normal temperatures. It only indicates that all of the La Nina years have averaged out to near normal when the data is combined. More than likely, most of these individual years have seen readings either above or below normal. Note* - All the following charts of the United State are for anomalies during the meteorological winter which includes December, January and February combined.

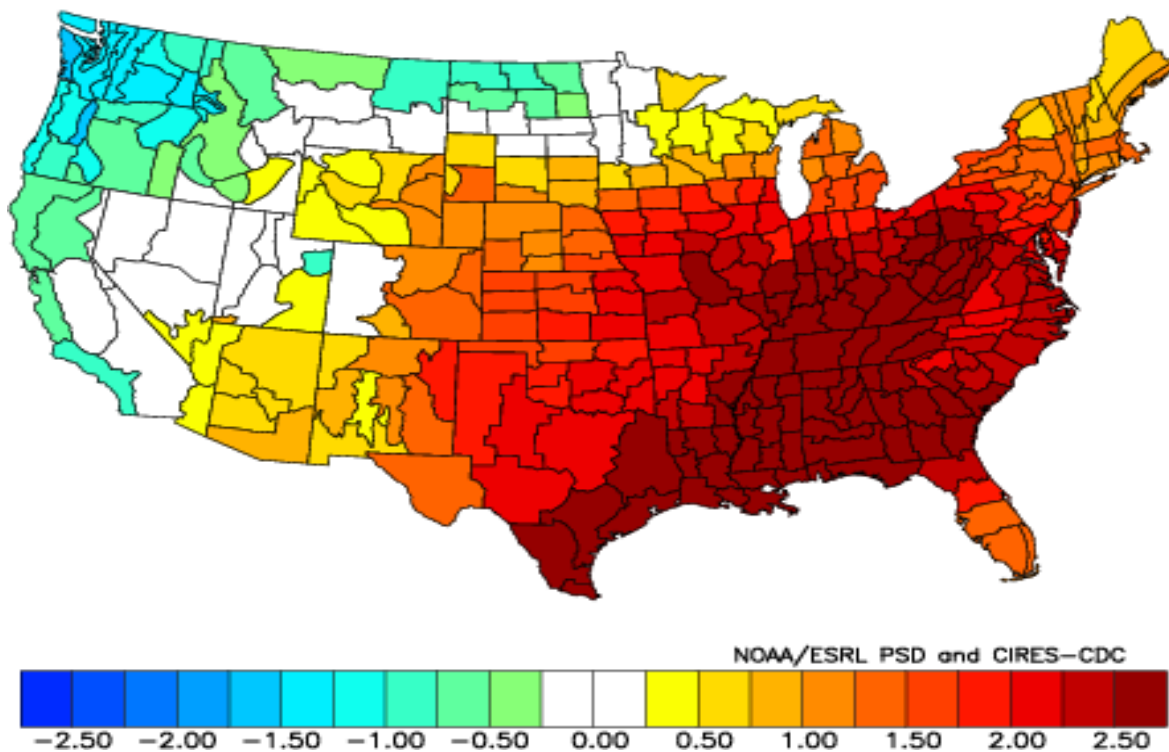


The second image below shows temperature anomalies for moderate and strong La Nina's with weak events filtered out. These would include events with ONI values of -1.0 or lower. These stronger events indicate that temperatures trend slightly warmer than normal across Iowa as well as much of the southeastern half of the United States. The northwestern third of the country has a better chance of seeing below normal temperatures under these conditions.



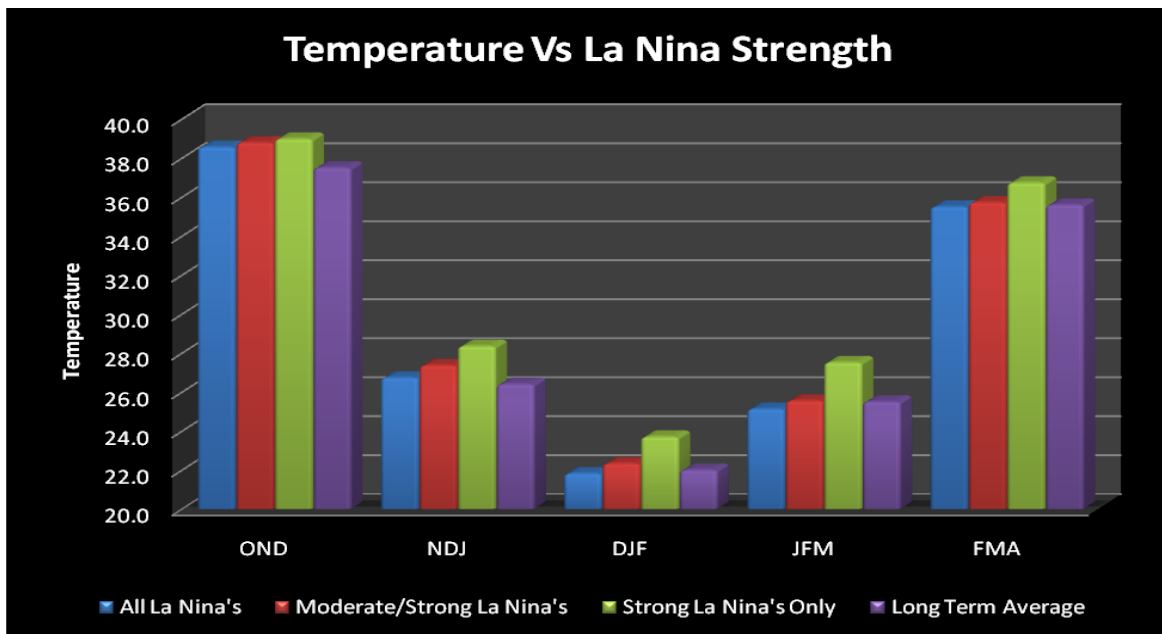
The third image below shows the temperature anomalies for strong La Nina's only. These would include events where the ONI is -1.5 or lower. The signal for warmer readings is apparent in Iowa with temperatures ranging from about 1.5 to 2.0 degrees above normal. The southeastern United States continues to show well above normal readings with the Pacific Northwest remaining relatively cool.

Composite Temperature Anomalies (F)
 Dec to Feb 1949–50, 1955–56, 1973–74, 1975–76, 1988–89, 1999–00
 Versus 1950–1995 Longterm Average

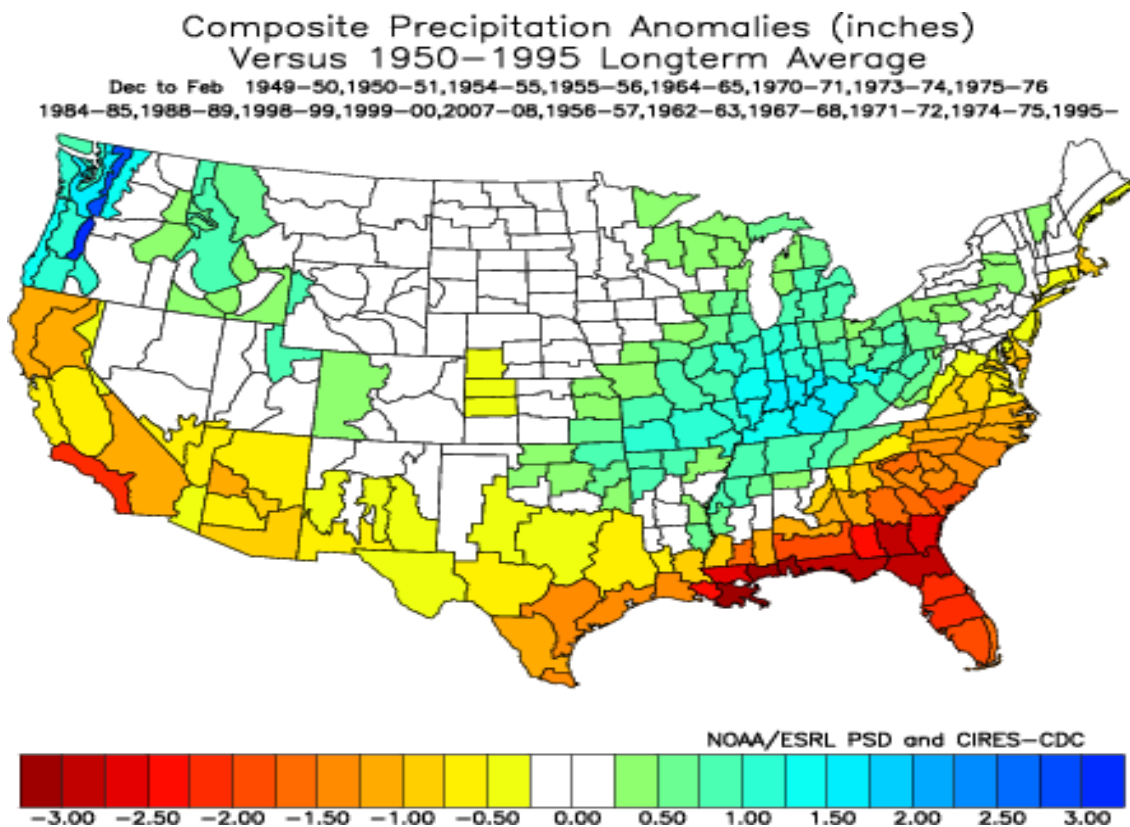


The following chart illustrates the temperature departure for Iowa during La Nina winters. The chart is a comparison of temperatures between all La Nina years (20 cases), moderate and strong La Nina years (13 cases), only strong La Nina years (6 cases), and the long term average (137 years) over the 3-month periods for which the ONI index is calculated. As with the preceding graphics, the chart indicates that as the strength of La Nina increases, there is an increase in the probability of seeing above normal temperatures. When looking at all cases, there are generally equal chances of seeing above or below normal temperatures. In fact, of the 20 La Nina events, 11 were below normal and 9 were above normal. However, as the strength of La Nina increases there are more cases of above normal than below normal temperatures in Iowa. This is apparent with 4 of the 6 strong cases above normal in Iowa, one near normal and the last one below normal.

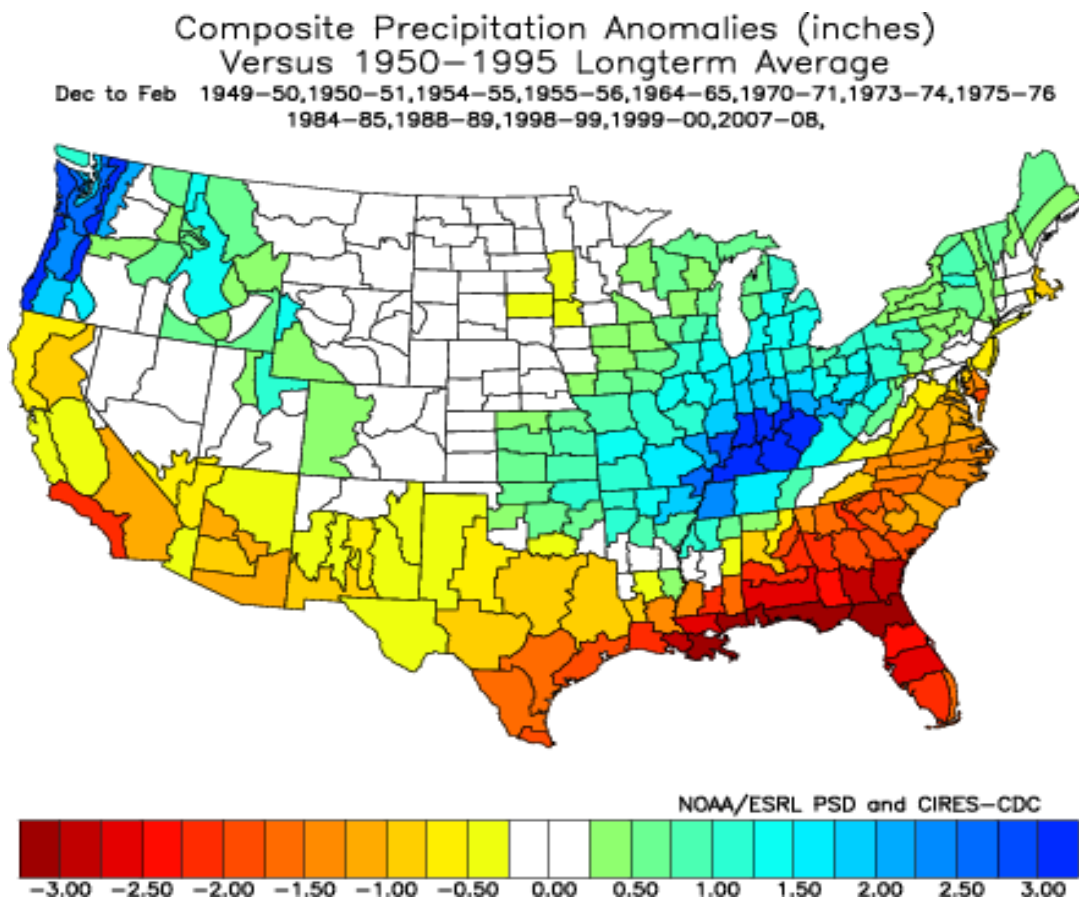
The current La Nina is already moderate in strength which may be indicating that temperatures could be slightly warmer than normal across the state. However, as was the case in the moderate 2007-08 La Nina, temperatures averaged over 4 degrees below normal so there remains some uncertainty in such forecasts.



The next image below displays the precipitation across the county and has a distinctive pattern that occurs with all La Nina cases where ONI is -0.5 or lower. Below normal precipitation is common along the southern edge of the United States into the Mid-Atlantic Coast. Above normal precipitation is expected through the Ohio River valley and in the Pacific Northwest. Iowa generally sees near normal precipitation for much of the state with slightly above normal precipitation in far southeastern counties.

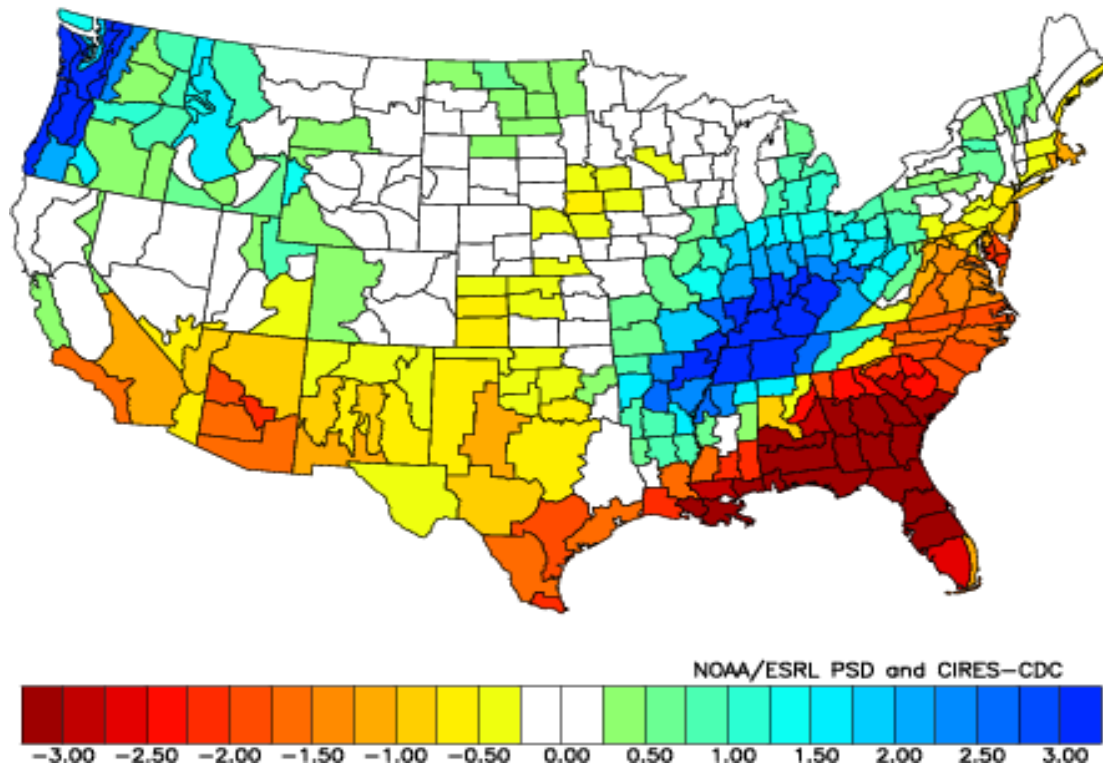


The image below is for moderate and strong La Nina cases where ONI is -1.0 or lower, indicating a very slight increase in chances for above normal precipitation into Iowa during the more intense La Nina's. California, the deep South and the East coast all continue to show strong indications of below normal precipitation as well. The wetter than normal areas continue to be in the Pacific Northwest and the Ohio River Valley.

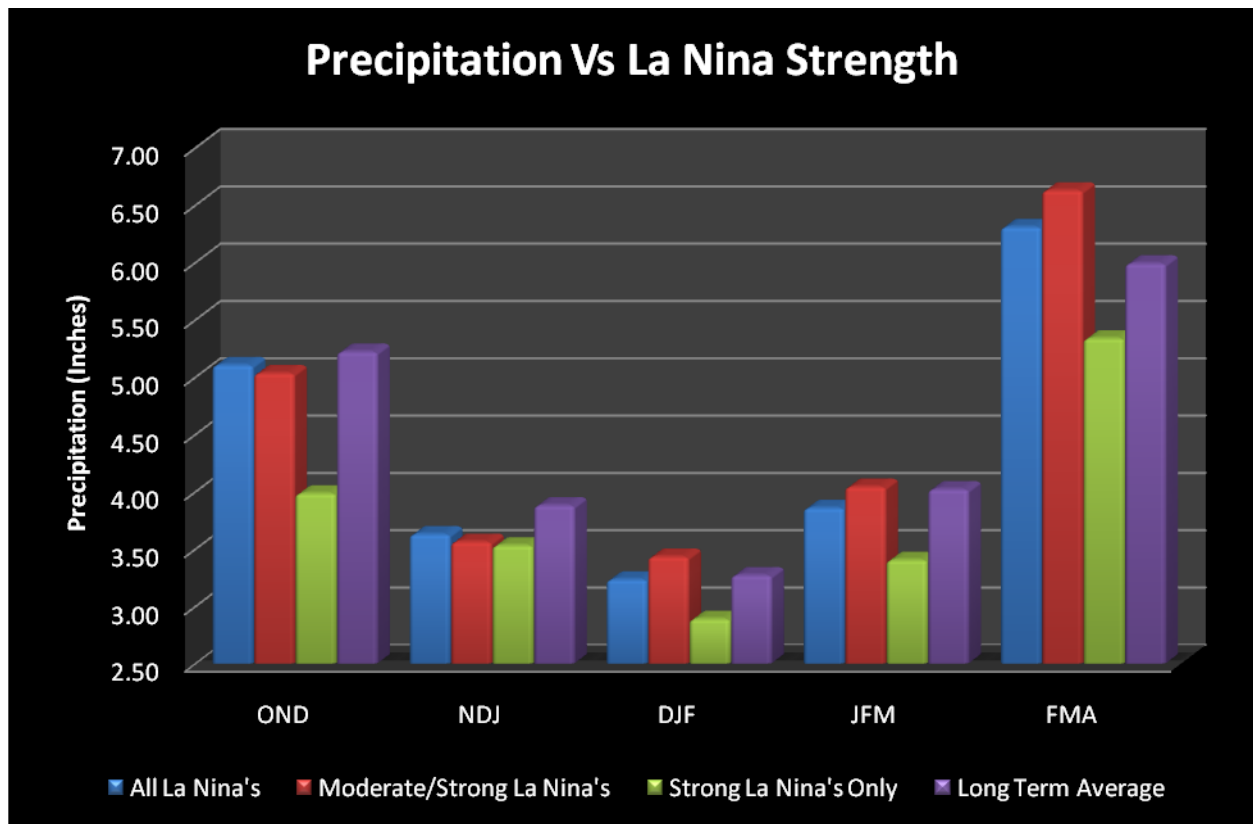


The final image below is for only strong La Nina's where the ONI is -1.5 or lower. The wetter than normal signal continues to increase and expand through the Ohio River valley and the Pacific Northwest. California also receives more rain during the very strong La Nina's as opposed to the weaker events. However, the far southeastern United States remains drier than normal. Iowa actually becomes slightly drier than normal during strong cases of La Nina, mainly in the northwestern third of the state with near normal precipitation elsewhere.

Composite Precipitation Anomalies (inches)
 Dec to Feb 1949–50,1955–56,1973–74,1975–76,1988–89,1999–00
 Versus 1950–1995 Longterm Average



The chart below displays the precipitation for Iowa against the strength of La Nina. The graph supports the information in the above images and indicates that precipitation increases slightly as the weaker events are discarded. However, for only strong cases precipitation generally falls below normal across the state in all time frames from the late fall into the early spring. For all 20 cases of La Nina since 1950 in Iowa, 9 were above normal and 11 were below normal. Even the moderate and strong cases combined had 7 above and 6 below normal. In other words, there are few if any trends to discriminate the likely precipitation amounts for La Nina years when looking solely at the ONI index.



The upcoming seasonal outlooks for the nation can be found at the Climate Prediction Center [website](#).

For the specific 3-month outlooks across the nation, click [here](#).

For local temperature outlooks for central Iowa, click [here](#).

For any questions or comments, please contact craig.cogil@noaa.gov.